

WHAT IS CLAIMED IS:

1. An electrophoresis apparatus comprising a planar plate formed therein with a channel for electrophoretic separation, a light irradiating means for irradiating an excitation beam into a detection part formed in a part of the channel, a fluorescence detecting means for detecting a degree of fluorescence which is generated from a sample by the excitation beam, the channel having a rectangular cross-sectional shape and being composed of a top surface and a bottom surface which are parallel with the surface of the planar plate, and left and right wall surfaces, a first flat and smooth incoming window formed in the bottom surface of the channel, a second flat and smooth incoming window formed on a surface of the planar plate at a position which is opposed to the first incoming window, for introducing an excitation beam into the planar plate, an excitation transmission path formed between the first and second incoming windows, a first flat and smooth outgoing window formed in one of the side wall surfaces of the channel, for emitting fluorescence from the sample, and a second flat and smooth outgoing window formed in a side surface of the planar plate at a position opposed to the first outgoing window, for emitting the fluorescence outside of the planar plate, and a fluorescent transmission path between the first outgoing window and the second outgoing window.

2. An electrophoresis apparatus comprising a planar plate formed therein with a channel for electrophoretic separation, a light irradiating means for irradiating an excitation beam into a detection part formed in a part of the channel, a fluorescence detecting means for detecting a degree of fluorescence which is generated from a sample by the excitation beam, the channel being a capillary channel having a rectangular cross-sectional shape and being composed of a top surface and a bottom surface which are parallel with the surface of the planar plate, and left and right wall surfaces, a first flat and smooth incoming window formed in one of the side surfaces of the capillary channel, for introducing the excitation beam into the channel, a second flat and smooth incoming window formed on a surface of the planar plate at a position which is opposed to the first incoming window, for introducing an excitation beam into the planar plate, an excitation transmission path formed between the first and second incoming windows, a first flat and smooth outgoing window formed in the bottom surface of the channel, for emitting fluorescence from the sample, and a second flat and smooth outgoing window formed in a surface of the planar plate at a position opposed to the first outgoing window, for emitting the fluorescence outside of the planar plate, and a fluorescent transmission path between the first outgoing window and the second outgoing window.

3. An electrophoresis apparatus as set forth in claim 1, wherein said planar plate is formed of a transparent member in its entirety, and said transparent member is adapted to serve as said excitation transmission path and said fluorescence transmission path.

4. An electrophoresis apparatus as set forth in claim 1, wherein light converging means is provided to either or each of both said excitation transmission path and said fluorescence transmission path.

5. An electrophoresis apparatus as set forth in claim 1, wherein light splitting means is provided in the fluorescence transmission path.

6. An electrophoresis apparatus as set forth in claim 1, wherein a spatial filter is provided in the fluorescence transmission path.

7. An electrophoresis apparatus as set forth in claim 1, wherein said planar plate is composed of a first planar plate which is formed through transcription in one batch by means of a transcription mold plate incorporating a male structure for forming channels at predetermined positions and a male structure for forming optical means, and a second transparent plate joined to the first planar plate.

8. An electrophoresis apparatus as set forth in claim 1, wherein said male and female structures in the transcription mold are fine structures which are formed by optically exposing and then developing a

photosensitive resin film.

9. An electrophoresis apparatus as set forth in claim 7, wherein said first planar plate is made of thermosetting resin.

10. An electrophoresis apparatus as set forth in claim 1, wherein a plurality of planar plates each of which corresponds to said planar plate are stacked one upon another so that channels in said plurality of planar plates are overlapped with one another, light irradiating means is provided at a position where a single excitation beam from said light irradiating means can be led through the channels in the planar plates layered one another, and fluorescent detecting means are provided at positions in extension of outgoing windows formed in side surfaces of said planar plates stacked one upon another.

11. An electrophoresis apparatus as set forth in claim 1, wherein a plurality of channels are formed in one and the same plane in said planar plate, a light irradiating means is provided at a position where a single excitation beam from said light irradiating means can pass through said plurality of channels at the same time, and a fluorescent detecting means is provided at a position in extension of the outgoing window formed in the bottom surface of the planar plate.